HANFORD FORWARD

DEMOLITION UNDERWAY AT HANFORD'S PLUTONIUM FINISHING PLANT

CENTRAL PLATEAU
Hanford Site Completes Successful River Corridor Closure Contract Transition

SITEWIDE
Hanford Contractors Earn Highest DOE Safety Awards

TANKS
CBC Training Future Hanford Workers

WINTER 2016 ISSUE

QUARTERLY PUBLICATION COVERING
HANFORD CLEANUP NEWS & PROGRESS

RICHLAND OPERATIONS OFFICE
United States Department of Energy

The Richland Operations Office is responsible for cleanup of much of Hanford's waste including preparing and demolishing the Plutonium Finishing Plant, disposing of contaminated soil and solid waste, and treating groundwater, while providing occupational medical services and configuring site infrastructure for the future.

ch2m.

CH2M HILL Plateau Remediation Company (CH2M) is the prime contractor for the safe, environmental cleanup of the Central Plateau. CH2M's responsibilities include waste retrieval and fuels management, groundwater remediation and demolition of facilities and canyons, and closure of the Plutonium Finishing Plant.

HPMC
OCCUPATIONAL
MEDICAL SERVICES

HPMC Occupational Medical Services provides occupational medical services to the Department of Energy and to Hanford employees.

MSA
Mission Support Alliance

Mission Support Alliance (MSA) is responsible for integrated infrastructure services for the Hanford cleanup mission, including roads and transportation services; electrical and water services; facility maintenance; emergency response (fire and patrol) services; network and software engineering as well as environmental compliance and clean energy solutions.

OFFICE OF
RIVER PROTECTION
United States Department of Energy

The Office of River Protection is responsible for the retrieval, treatment, and disposal of Hanford's tank waste in a safe, efficient manner. The River Protection Project is the largest and most complex environmental remediation project in the nation.

BECHTEL

Bechtel National Inc. is responsible for designing, building and commissioning the world's largest radioactive and chemical waste treatment plant. When completed, the plant will be used to solidify the radioactive liquid waste stored in 177 aging underground tanks using a process called vitrification.

washington river protection solutions

Washington River Protection Solutions is responsible for storing and retrieving the approximately 56 million gallons of nuclear and chemical waste stored in Hanford's tanks.

WAI
WASTREN ADVANTAGE INC

Wastren Advantage, Inc. is the prime contractor responsible for managing the 222-S Laboratory.

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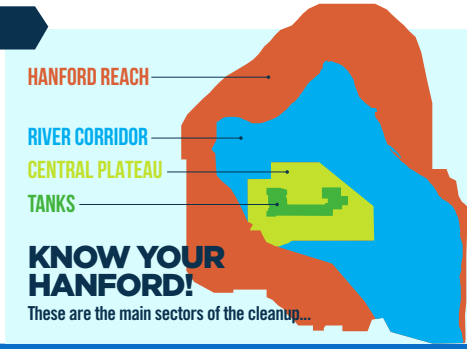
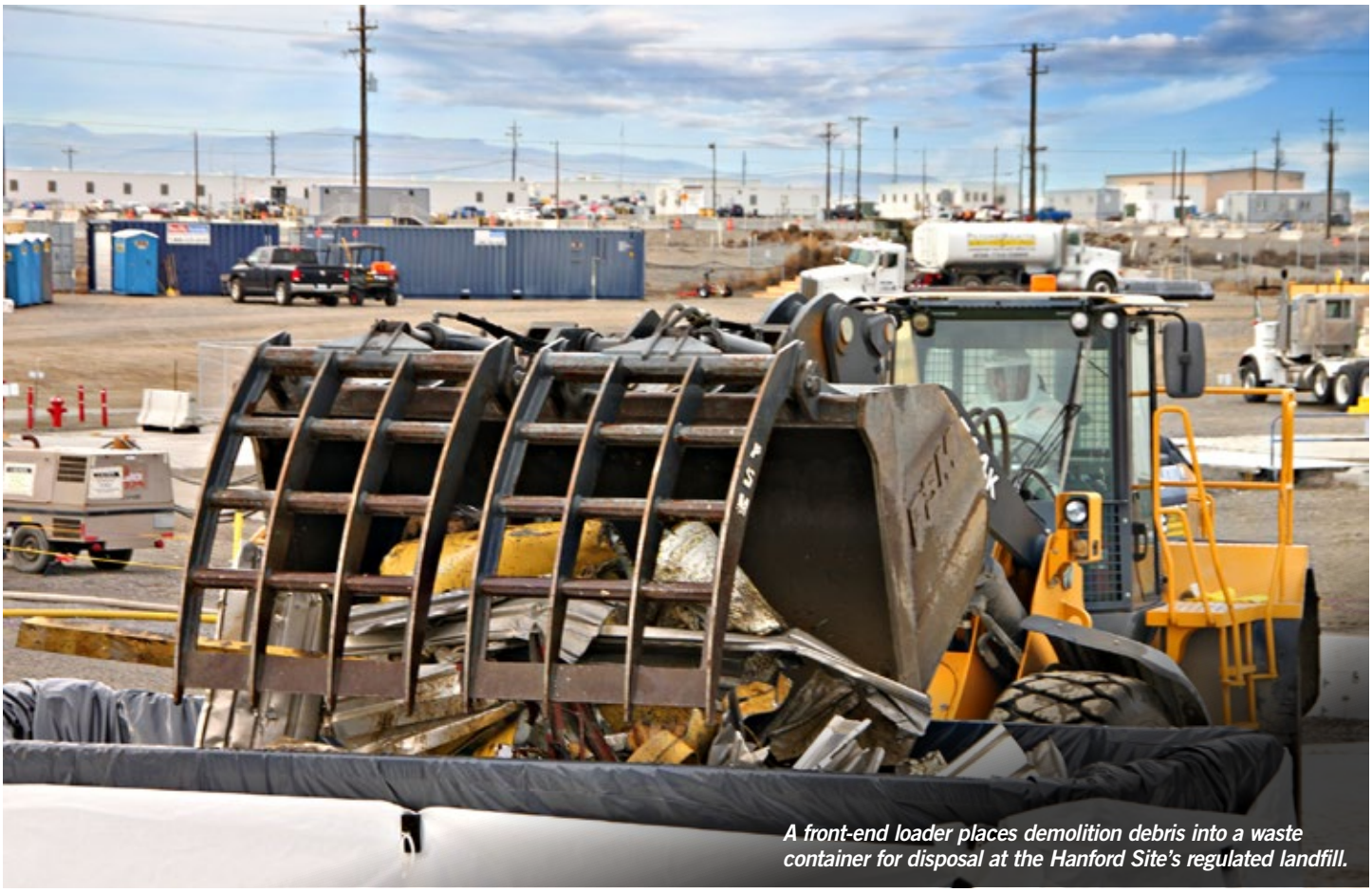


DEMOLITION UNDERWAY AT HANFORD'S PLUTONIUM FINISHING PLANT

After nearly 20 years of preparation, demolition is underway at Hanford's Plutonium Finishing Plant (PFP). On November 1, heavy equipment began removing portions of the Plutonium Reclamation Facility (PRF), one of the four buildings that make up the facility and the first to be demolished.

‹ Shears remove the fourth floor of the Plutonium Reclamation Facility. Aerial and ground-based dust suppression equipment will control particulates during demolition.

DEMOLITION UNDERWAY AT PFP – CONTINUED



A front-end loader places demolition debris into a waste container for disposal at the Hanford Site's regulated landfill.

"PFP is one of the most hazardous buildings on the Hanford Site, and the safe start to demolition is a history-making achievement for site cleanup, the community and the employees doing the work," said Doug Shoop, manager of the Department of Energy's (DOE) Richland Operations Office.

PFP produced approximately two-thirds of the nation's plutonium during its 50 years of production, which left the facility heavily contaminated. After production stopped in 1989, employees stabilized and removed the leftover plutonium and removed contaminated processing equipment from the building – all work needed to enable today's demolition, which will remove a significant risk on the Hanford Site.

> **"THE PFP WORKFORCE IS THE BEST IN THE BUSINESS."**
>
> ***– Tom Bratvold, CH2M vice president for the PFP Closure Project***

DOE and contractor CH2M HILL Plateau Remediation Company (CH2M) have numerous controls in place to ensure a safe and compliant demolition including: extensive dust suppression, air monitoring, site access controls and the use of a structural engineer to demolish the building as safely as possible.

VIDEO: Watch a time lapse of the first few weeks of demolition here.

"The PFP workforce is the best in the business," said Tom Bratvold, CH2M vice president for the PFP Closure Project. "Their expertise and involvement have allowed tremendous progress on this complicated and challenging project, and I am confident that safe progress will continue through demolition."

PRF demolition is expected to take about four months, during which crews will also demolish the adjacent Americium Recovery Facility (also known as the McCluskey Room). Then, crews will begin demolishing the main processing facility and the plant's fan house and ventilation stack.

The 19-ton caustic scrubber is part of the off-gas treatment system that will remove contaminants from the melter exhaust before it is released into the environment.

DOE MAKES SIGNIFICANT PROGRESS AT HANFORD VIT PLANT IN FY 2016

The U.S. Department of Energy, Office of River Protection (ORP), and contractor Bechtel National, Inc. (BNI), completed significant work at the Hanford Waste Treatment and Immobilization Plant's (WTP) Low-Activity Waste (LAW) Facility in fiscal year (FY 2016) and are now preparing the LAW Facility site for the final stages of construction.

Employees at the WTP, also known as the "Vit Plant," completed fabricating two 300-ton melters that will be the heart of the vitrification process in the LAW Facility to treat the Hanford tank waste. The vitrification process blends waste and glass-forming elements in the melters then heats the mixture to 2,100 °F. The molten material is poured into containers, where it solidifies as it cools. The containers will be placed in a permanent disposal facility on site.

To date, WTP employees have installed two of the three major components of the melter off-gas treatment system, with the third and final piece scheduled to arrive later this fall. The off-gas treatment system captures and removes contaminated materials and harmful gases, or effluents, from the melters' exhaust, making it suitable for release.

"The physical progress made this past year at the Vit Plant is very apparent to our staff and visitors," said Kevin Smith, ORP manager. "The construction progress moves us closer to achieving our direct feed of low-activity waste as soon as 2022."

The LAW Facility is the centerpiece of DOE's sequenced approach, known as Direct Feed LAW (DFLAW), to begin treating Hanford's tank waste as soon as 2022.

"By the end of this year, we will have received all of the major pieces of engineered equipment for the LAW Facility," said Peggy McCullough, BNI project director. "It puts us in an excellent position to declare 'construction complete' in 2018." ✱

SMALL BUSINESSES CONTRIBUTE TO SUCCESS AT HANFORD

Small businesses contribute greatly to the success of cleanup and help upgrade and right-size the Hanford Site's infrastructure. Here, Jared Janosky, a project manager for Mission Support Alliance subcontractor Watts, inspects casing spacers.

Small businesses play an important role in the cleanup mission at the Hanford Site. During fiscal year 2016, Hanford prime contractors awarded $626 million in subcontracting work, with $391 million awarded to small businesses.

"These companies are integral to pushing progress on the Hanford Site," said Sally Sieracki, director of the procurement division for the Richland Operations Office. "Their employees are the specialized experts and provide a range of great services to support cleanup."

In fiscal year 2016:

- CH2M HILL Plateau Remediation Company awarded $151 million in contracts and purchases, with $129 million (or 85 percent), of those awards going to small businesses. This supports the company's goal of placing more than 49 percent of all contract work with small businesses and demonstrates their commitment to the local community.
- Mission Support Alliance awarded $122 million worth of supplies and services contracts (about 73 percent) to small businesses.
- Bechtel awarded more than $155 million in subcontracts to businesses across the United States, with a growing emphasis on equipment and goods that meet highly specialized requirements for nuclear quality.

Workers from CH2M Hill Plateau Remediation Company subcontractor Stillwater drill a groundwater well in the Hanford Site's 100-N Area.

- Washington River Protection Solutions (WRPS) awarded $189 million in subcontracts, (with 73.2 percent) or $139 million awarded to small businesses. WRPS is committed to continually exceeding its small business goal of 58.2 percent.

"Small businesses play a significant role in helping the Office of River Protection carry out its environmental management mission," says Marc McCusker, director of contracts and property management. "By utilizing small businesses both the Office of River Protection and its contractors can bring in highly skilled and experienced companies to perform scopes of work that they may not be able to successfully perform themselves."

DOE and Hanford contractors remain committed to helping small businesses grow and positioning them for future success. ✱

WASHINGTON RIVER PROTECTION SOLUTIONS HONORED FOR LIFESAVING INNOVATION

Washington River Protection Solutions (WRPS) has been recognized for helping develop a special face shield that protects a worker wearing full-face respiratory equipment from an arc flash, a type of electrical explosion or discharge where temperatures can reach 36,000 degrees Fahrenheit.

WRPS, the Hanford tank operations contractor for the U.S. Department of Energy's Office of River Protection, received the VPP Innovation Award in August at the Voluntary Protection Program Participants' Association (VPPPA) national conference in Kissimmee, Fla.

An arc flash results in a hot blinding flash of light and a deafening noise. An enormous amount of concentrated energy is forced outward from the electrical equipment toward the worker, spreading hot gases and molten metal.

The face shield is currently being used by all WRPS electricians and some electricians working for other Hanford contractors.

David Kuster, one of several WRPS electricians who worked with the vendor and the testing laboratories throughout the development process, called the product a game-changer. "In the past, workers had to weigh the hazards and choose whether to wear respiratory protection or arc flash protection. Now, we don't have to make that decision," he said.

> **"WRPS IS HONORED TO BE RECOGNIZED BY THE VPPPA, A TRUE LEADER IN THE SAFETY AND HEALTH INDUSTRY."**
>
> ***– Mark Lindholm, WRPS President***

To develop the face shield, several WRPS electricians worked with the vendor – Paulson Manufacturing Corporation of Temecula, Calif. – and the testing laboratories throughout the development process.

Mike Powers, the safety and health manager for WRPS' Single-Shell Tank Retrieval and Closure organization, also played a critical role as the liaison between the electricians, the company and and the vendor. In addition, several other WRPS safety professionals, WRPS management and representatives

from the U.S. Department of Energy contributed to developing the product.

"This innovation is an excellent example of what can be accomplished through teamwork," said Chris Thursby, manager of the WRPS Industrial Safety organization. "It also demonstrates how a VPP Star Site can solve important issues that reach across industry and political boundaries."

WRPS President Mark Lindholm is proud of the team's collaboration and resourcefulness, and that this was a worker-led initiative. "It began with workers questioning whether there was a better way to guard against arc flashes and resulted in a product that can save lives," he said.

WRPS also received the VPP Star of Excellence Award at the national conference for maintaining a total recordable injury case rate 75 percent lower than the industry average.

This marks the second consecutive year WRPS has won both the Innovation Award and the VPP Star of Excellence Award. Last year, the company was honored for developing a tool that reduces worker exposure while surveying radioactive equipment used to retrieve tank waste.

"WRPS is honored to be recognized by the VPPPA, a true leader in the safety and health industry," Lindholm said. "These awards demonstrate our employees' dedication to working safely on a daily basis and their never ending pursuit of equipment and methods that can improve worker safety."

> **"THIS INNOVATION IS AN EXCELLENT EXAMPLE OF WHAT CAN BE ACCOMPLISHED THROUGH TEAMWORK."**
>
> ***– Chris Thursby, manager of the WRPS Industrial Safety organization***

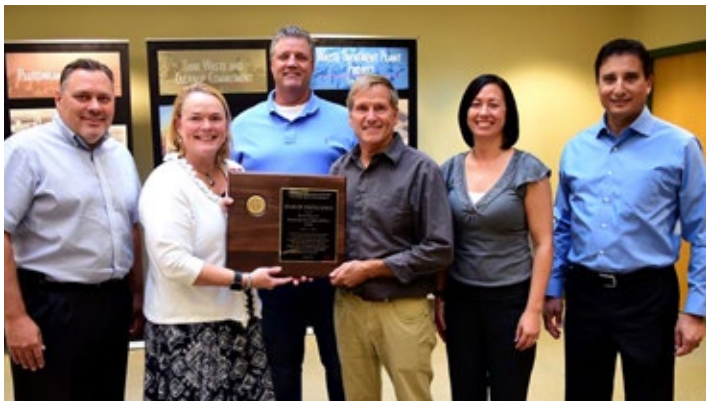
The VPPPA national conference brings together safety and health experts from more than 400 different industries committed to occupational safety and health excellence. VPPPA is a member-based association with a network of more than 2,500 companies and worksites that are involved in or are applying to the Occupational Safety and Health Administration's or DOE's Voluntary Protection Programs. WRPS was awarded VPP Star status in 2014. ✱

The new face shield protects a worker wearing full-face respiratory equipment from an arc flash, a type of electrical explosion or discharge where temperatures can reach 36,000 degrees Fahrenheit.

HANFORD CONTRACTORS EARN HIGHEST DOE SAFETY AWARDS

Several Department of Energy (DOE) Hanford contractors earned the highest DOE safety awards during the 32nd annual National Voluntary Protection Programs Participants' Association (VPPPA) Safety and Health Conference held August 29 through September 1, 2016, in Kissimmee, Florida.

- Bechtel National, Inc. (BNI), and Washington River Protection Solutions (WRPS) received Voluntary Protection Program (VPP) Star of Excellence awards, signifying they had Occupational Safety and Health Administration (OSHA) accident rates 75 percent lower than their industry counterparts.
- For their safety leadership and actions, CH2M HILL Plateau Remediation Company (CH2M) received a second consecutive VPP Star of Excellence. Worker involvement is key to CH2M's safety success and project performance, and their safety-conscious behavior earned this award.
- For the second consecutive year, the Hanford Vit Plant construction site was recognized with the Star of Excellence Award. The award recognizes a commitment to safety by all employees. In 2015, the site reported its best safety performance ever with a total recordable case rate of 0.57. For comparison, the Bureau of Labor Statistics national average for other construction sites was 3.0 in 2014.
- Mission Support Alliance (MSA) won the 2016 VPPPA Safety and Health Outreach Award. This award recognized MSA for providing a unique opportunity for local Boy and Girl Scouts to earn merit badges.



Pictured (left to right): Joe St. Julian, project director for the Vit Plant; Peggy McCullough, project director; Danny Hydrick, manager of Construction; Courtney Blanchard, ORP Safety & Health Division; Vanessa Parsons, VPP site coordinator; and Mike Costas, manager of Quality and Functions.

For their safety leadership and actions, CH2M HILL Plateau Remediation Company received a second consecutive Voluntary Protection Program Star of Excellence.

Stacy Thursby (sixth from the right) with the Voluntary Protection Program National Board of Directors, presented Mission Support Alliance with the Safety & Health Outreach award for their involvement with the Girl and Boy Scouts of Tri-Cities.

Mission Support Alliance's Safeguards & Security program received the Legacy of Stars award – the highest level of Voluntary Protection Program recognition available. The Legacy of Stars award is for participants who achieve the Star of Excellence for four consecutive years.

The HAMMER Federal Training Center received the Voluntary Protection Program Star of Excellence Award for keeping accident and injury rates significantly below comparison industries.

- MSA's Safeguards & Security program received the Legacy of Stars Award – the highest level of VPP recognition available. The Legacy of Stars award is for participants who achieve the Star of Excellence for four consecutive years.
- The HAMMER Federal Training Center received the Star of Excellence Award. This award recognizes that they have achieved Star status by implementing comprehensive safety and health management systems, while logging an injury and illness rate 75 percent below the comparable industry average.
- Wastren Advantage Inc. (WAI Hanford Laboratory) received the VPP Legacy of Stars Award. To achieve this legacy level, a company must have had four consecutive Star of Excellence awards.
- WRPS received the VPP Innovation Award for helping develop a special face shield that protects workers wearing full-face respiratory equipment from a partial arc flash, an electrical discharge where temperatures can reach 36,000 °F. WRPS also was awarded the VPP Star of Excellence Award for maintaining a total recordable injury case rate 75 percent below the industry average.

DOE launched VPP in 1994 to encourage and recognize excellence in occupational safety and health protection. The program outlines areas where DOE contractors and subcontractors can exceed compliance with DOE orders and OSHA standards. It relies on cooperation between managers, employees and the DOE to continuously improve health and safety programs. ✱

The Low-Activity Waste Pretreatment System facility will pretreat Hanford tank waste, separating low-activity waste from high-level radioactive waste, and feed the low-activity waste to the Waste Treatment Plant for vitrification.

DESIGN MILESTONE IN SIGHT FOR TANK WASTE TREATMENT SUPPORT FACILITY

The Department of Energy's Office of River Protection (DOE) is making progress on a planned phased approach to begin treating Hanford's tank waste as soon as 2022, with a key component set to reach a milestone in early 2017.

DOE expects to conduct a 60-percent design review for the Low Activity Waste Pretreatment System (LAWPS) in February 2017. This important step allows independent review of design choices to determine the final design path and guide future system testing plans. DOE conducted a 30-percent design review for the system earlier this year.

LAWPS is intended to separate out the low-activity waste then feed it to the Waste Treatment and Immobilization Plant's (WTP) Low-Activity Waste (LAW) Facility for vitrification, which immobilizes the waste in a stable glass form for long-term disposal. Using proven technology to separate the waste streams, LAWPS also can provide a backup for the WTP Pretreatment Facility.

> **"ONCE COMPLETED, DFLAW WILL ALLOW US TO START IMMOBILIZING TANK WASTE PERMANENTLY IN GLASS."**
>
> ***– Kevin Smith, DOE-ORP Manager***

DOE's phased approach to treat Hanford's tank waste, known as Direct Feed LAW (DFLAW), is intended to use the portions of WTP closest to completion — the LAW Facility, Analytical Laboratory and balance of support facilities — while working to resolve technical issues at the High-Level Waste and Pretreatment facilities.

"Using mature technologies and performing integrated system testing give the project a solid foundation to most quickly deliver this treatment capability," said Steve Pfaff, federal project director for the LAWPS project. "We will also gain valuable operating experience that will help with the future completion of the larger WTP Pretreatment Facility."

This summer, two of the three last major pieces of equipment for the LAW Facility, the ammonia skid and thermal catalytic oxidizer, were delivered and installed. Later in 2016, the final piece, the caustic scrubber, will be received and installed. These pieces are part of the off-gas treatment system, which is designed to capture contaminants from the melter ventilation system and ensure plant emissions meet regulatory requirements.

DOE has committed significant resources to advancing the construction and design of the DFLAW components. Because of this program's complex assortment of project activities, DOE also has updated the One System organization. Led by a board of DOE senior management, Hanford tank farms contractor

Kevin Smith, manager of the Department of Energy's Office of River Protection, officially opened the Integrated Engineering Scale Test Facility, which will test the technologies at 1/9th scale that will be used in the Low-Activity Waste Pretreatment System.

Washington River Protection Solutions and WTP contractor Bechtel National, the organization also comprises other DOE laboratory and contractor teams to integrate schedules and resolve issues to prioritize DFLAW activities.

"LAWPS connects the tank farms and WTP, and we are using the One System program to ensure that interface is seamless," said Kevin Smith, DOE-ORP manager. "Once completed, DFLAW will allow us to start immobilizing tank waste permanently in glass." ✱

Equipment used in soil vapor extraction reduced the level of carbon tetrachloride contamination on the Hanford Site.

HANFORD SITE TECHNOLOGY COMPLETES CLEANUP *TO PROTECT* GROUNDWATER

The Environmental Protection Agency has approved completion of a cleanup project on the Hanford Site that began nearly 25 years ago. The project removed nearly 90 tons of deep-soil contamination and reduced groundwater risk using a remediation technology known as soil vapor extraction.

The Department of Energy's Richland Operations Office and contractor CH2M HILL Plateau Remediation Company (CH2M) employed soil vapor extraction to clear contamination from the chemical carbon tetrachloride, which was used in Cold War plutonium processing operations. The chemical spread to an area covering approximately three-quarters of a square mile and approximately 200 feet deep in the center of the Hanford Site.

"This is a major accomplishment and success in our primary goal of protecting the groundwater, which also protects the Columbia River," said Michael Cline, director of DOE's Soil and Groundwater Division.

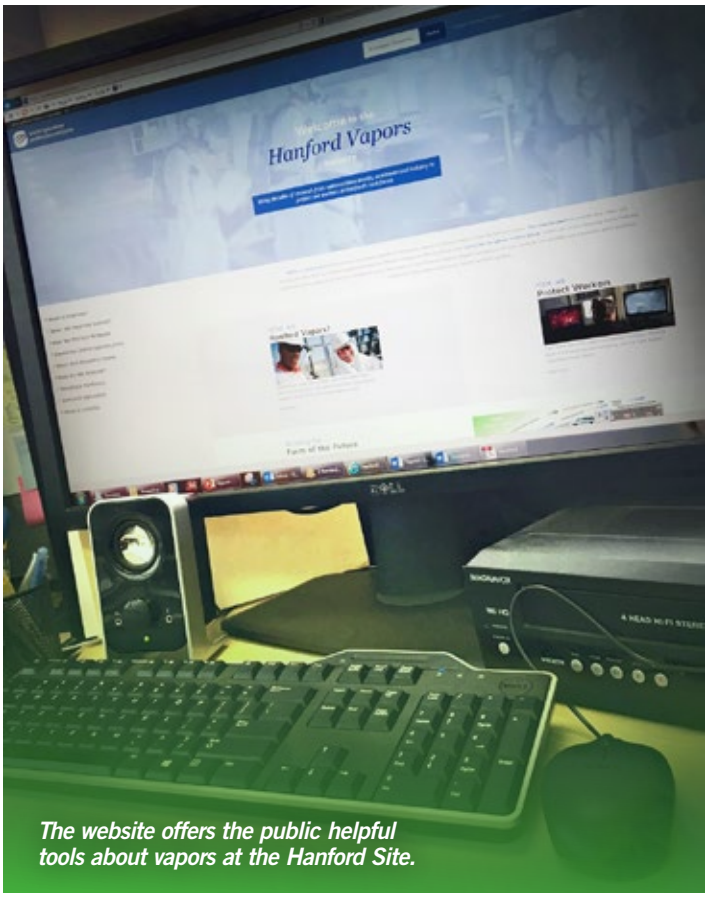
Nearly 90 tons of contamination have been removed since workers began operating the soil vapor extraction system to clean up carbon tetrachloride in 1992.

The system was shut down in 2012 after sampling results showed the carbon tetrachloride levels below final cleanup levels. A study performed from 2012 through 2015 showed that the chemical had been sufficiently removed, leaving no continuing source.

The U.S. Environmental Protection Agency approved a soil vapor extraction action report in August 2016, completing all actions associated with carbon tetrachloride removal in that area.

"Our team of experts worked to track the contamination and maintain the systems to ensure removal of the largest amount of contamination possible," said John Rendall, vice president of CH2M's Soil and Groundwater Remediation Project. "Due to the expertise of our team and other support groups, we achieved the legal cleanup level for carbon tetrachloride and were able to permanently end soil vapor extraction operations."

Removal of this contamination was crucial because it reduced the amount of contamination reaching the groundwater. ✱



The website offers the public helpful tools about vapors at the Hanford Site.

WRPS EXPANDS WEB-BASED TOOLS ON CHEMICAL VAPORS

Tank farms contractor, Washington River Protection Solutions (WRPS), launched the hanfordvapors.com website during the summer of 2016 to help the workforce and the public understand chemical vapors at the Hanford Site.

WRPS has redesigned and expanded its vapors website to include new content developed by a cross-section of site workers (union, professional and management representatives) who are leaders in their fields. Over six weeks, the team rebuilt the website from the ground up in a collaborative effort to increase and improve the flow of information to the workforce and the public.

Available tools include:

- Access to field data and sampling results
- More complete information about how WRPS protects workers
- An explanation of technologies being developed and tested in the field
- Expanded definitions and background on a number of vapors-related topics

"We are putting a priority on information, transparency and trust," said Mark Lindholm, WRPS president. "This website allows interested parties to have an informed dialogue on this important issue so we can all work together toward our shared goal—safely cleaning up the Hanford Site."

The tools and information available on the website are part of broader efforts by WRPS to increase their engagement with the workforce and stakeholders on the chemical vapors issue. The website integrates social media platforms—including WRPS' Twitter (@wrpstoc) and Facebook (facebook.com/wrpstoc) accounts—to help maximize online communication.

The website is intended to serve as an important information source in the vapors discussion. Visitors are encouraged to sign up to receive email alerts when new information is posted. They can submit questions, comments and feedback via an email address provided on the homepage. ✱

WASTE TREATMENT PLANT ACHIEVES IMPORTANT STEP TOWARD OPERATIONS

The contractor for the U.S. Department of Energy's (DOE) Waste Treatment and Immobilization Plant (WTP), known as the Vit Plant, recently attained a significant achievement when it safely brought permanent power to Building 87, the primary electrical switchgear building at the 65-acre WTP construction site.

The installation of a permanent energy supply occurred on September 17 at approximately 8:30 a.m. when the initial breaker was closed from a Hanford Site substation connecting site power to the WTP electrical distribution system. By late morning, the three remaining breakers were closed and startup test engineers began system testing of Building 87's electrical components.

"I'm very pleased to see the progress that continues at the WTP," said Bill Hamel, assistant manager in charge of the WTP at the DOE, Office of River Protection. "This accomplishment is the culmination of a lot of hard work by the Bechtel and DOE teams."

The plant's four major nuclear facilities, and 21 infrastructure systems and facilities, have been operating on temporary power, which is typical for buildings under construction. As the remaining infrastructure facilities construction is completed, the facilities will be properly tested then provided with additional permanent utilities such as water, compressed air, steam and fire protection.

Successfully completing all infrastructure facilities will enable the plant to operate the WTP Low-Activity Waste (LAW) Facility and the Analytical Laboratory, as part of the Direct Feed Low-Activity Waste process, or DFLAW. The Analytical Laboratory is 95 percent complete, and construction of the LAW Facility is expected to be complete in mid-2018. Through DFLAW, DOE expects to begin waste treatment as soon as 2022.

"Energization of Building 87 represents the transition from temporary construction-phase utilities to permanent utilities that will operate the Vit Plant," said Peggy McCullough, Bechtel project director. "We are on track and moving swiftly to completing construction of the Low-Activity Waste facility, utility systems, and the portion of the Analytical Laboratory that will support direct feed of low-activity waste."

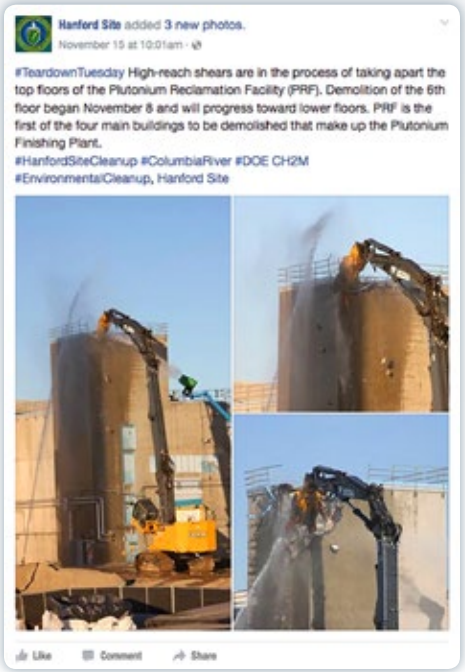
Bechtel National, Inc., is the DOE contractor in charge of building the plant. Using a process called vitrification, the plant will immobilize millions of gallons of chemical and radioactive waste, currently stored in Hanford's 177 underground tanks, into glass.

"The pace of construction, startup and commissioning will increase considerably over the next few years," said McCullough. "Our goal, ultimately, is to deliver a plant that can treat the waste in a manner that protects the public and the river." ✱

GET SOCIAL WITH DOE

Stay connected on social media to see what's happening around the Hanford Site. With more than 500 square miles of activity, it's easy to forget just how much is going on! Follow us on Facebook and Twitter to get the latest.

@HanfordSite @HanfordSite



HANFORD 2016 HIGHLIGHTS

At the Plutonium Finishing Plant, employees completed all readiness activities to enable the start of demolition, which began in November.

In groundwater, employees treated 2.1 billion gallons of contaminated groundwater, removing more than 180,000 pounds of contamination this year. The Environmental Protection Agency has approved the completion of a cleanup project that began nearly 25 years ago that successfully removed nearly 90 tons of deep-soil contamination and reduced groundwater risk using a remediation technology known as soil vapor extraction.

Employees continue to complete DOE's highest priority projects along the River Corridor. When CH2M Plateau Remediation Company assumed the River Corridor Closure Contract scope from Washington Closure Hanford (WCH) in 2016, they retained the talented WCH employees who made significant progress and continue to do so.

At the 618-10 burial ground, employees will finish removing highly contaminated waste-filled vertical pipes. This is critical risk reduction due to its proximity to Richland.

At the tank farms, employees completed removal of waste from tank C-111, marking the 15th of 16 tanks to be retrieved in Hanford's C Farm. Workers also retrieved waste from tank AY-102 to the limits of standard sluicing technology and installed four extended-reach sluicer systems in preparation for the next round of retrieval.

Workers also successfully restarted the Effluent Treatment Facility and proceeded to process more than 4 million gallons of waste water. ✱

HANFORD 2016 BY THE NUMBERS...

	1989 – FY15	FUTURE
SQUARE MILES	504 of 586 square miles of active footprint completed	*82 square miles of active cleanup remaining*
WASTE SITES	1,303 of 2,028* waste sites remediated	*725 waste sites remaining*
FACILITIES	877 of 1,708 facilities demolished/ removed	*831 facilities remaining*
TANKS	Retrieval completed in 16 of 177 tanks	*161 tanks remaining*
CLEANUP DEBRIS	18 million tons of soil, debris sent to ERDF**	*ONGOING*
GROUNDWATER	15.5 billion gallons of groundwater treated	*ONGOING*

* *The facilities list has been undergoing a big data reconciliation, and about 40 facilities were added as a result.*

** *Environmental Restoration Disposal Facility*

HANFORD SITE COMPLETES SUCCESSFUL RIVER CORRIDOR CLOSURE CONTRACT TRANSITION

CH2M Hill Plateau Remediation Company welcomed and supported transitioning employees at an orientation session.

Approximately 320 Hanford Site workers arrived at work in late August as new employees of CH2M HILL Plateau Remediation Company (CH2M), which assumed the River Corridor Closure Contract scope when Washington Closure Hanford's (WCH) contract ended September 30.

"The contract ended, but the cleanup work important to the community and our stakeholders did not," said John Neath Department of Energy (DOE), Richland Operations Office (RL) transition manager. "Many people were involved in ensuring a collaborative and smooth transition."

Teams from WCH and CH2M spent months making the transition as safe and seamless as possible, reviewing project statuses, timelines, scope, compliance requirements and processes for the Environmental Restoration Disposal Facility and 618-10 Burial Ground work.

Weekly meetings served to transition human resources, information technology (IT) and other support services. Regular communications kept WCH and CH2M employees informed.

"I appreciate the long hours and attention to detail that ultimately allowed important cleanup work to continue during this time," said Mike Jennings, CH2M transition manager. "The knowledge and skill that we retained on this important cleanup work will allow us to advance the mission into the future."

CH2M, WCH and Mission Support Alliance (MSA), the contractor responsible for managing IT and other services across the site, joined forces to achieve a major accomplishment in record time by providing a smooth transition for the approximately 320 workers under the new contract.

The IT transition team.

As WCH's contract wound down, CH2M reached out to MSA to help make sure computers, Internet and phone services were available to the new CH2M workers on their first day. After months of planning and behind-the-scenes preparation, the technicians, network and software engineers, project managers and Teamsters had only three days to successfully reset the employees' work stations.

"This was a great team effort that demonstrated cooperation and efficiency under a very tight deadline and short timeframe for the actual transition," said Ben Ellison, RL chief information officer.

The contractors closed WCH's data center containing 65 servers to help DOE reduce its IT and carbon footprints. The closure was intended to cut energy use, consolidate infrastructures, optimize existing facilities, and achieve cost savings. ✱

Mission Support Alliance biologist Justin Wilde releases the barn owl onto the Hanford Site.

MSA RELEASES REHABILITATED OWL

This fall, Mission Support Alliance (MSA) wildlife biologists released a rehabilitated barn owl back into the wild. A Central Pre-Mix employee discovered the owl during construction activities at the Hanford Vit Plant. He immediately initiated a chain of notifications that led to a Hanford Site wildlife biologist taking the owl to the Blue Mountain Wildlife Rehabilitation & Education Center.

After less than a week at the Pendleton, Oregon, Center, Blue Mountain staff transferred the owl back to MSA's Ecological Monitoring Program and MSA wildlife biologists released it back into its native habitat.

"We were very fortunate the volunteers at Blue Mountain Wildlife were able to fully rehabilitate the owl," said Justin Wilde, a wildlife biologist with MSA. "Releasing an animal back into its environment is a rare opportunity for us. Today was very exciting."

MSA's Ecological Monitoring program monitors and manages the site's habitats, plants, and wildlife. Hanford is home to numerous species of animals, including elk, jackrabbits and more than 200 species of birds, including owls and bald eagles. Among the Ecological Monitoring Program's other responsibilities are ensuring compliance with regulations and determining potential impacts to the varied habitats and wildlife on Site.

The Vit Plant team thanks Central Pre-Mix Concrete Co. and its employees for following Hanford's core values of safety and quality and stopping work when an issue was identified. ✱

> "RELEASING AN ANIMAL BACK INTO ITS ENVIRONMENT IS A RARE OPPORTUNITY FOR US. TODAY WAS VERY EXCITING."
>
> *– Justin Wilde, MSA Wildlife Biologist*

SIGNIFICANT PROGRESS TOWARD CAPSULE DRY STORAGE AT HANFORD

The Waste Encapsulation and Storage Facility is an aging facility with high operating costs. The facility represents the largest risk in the Department of Energy complex for a beyond-design-basis accident.

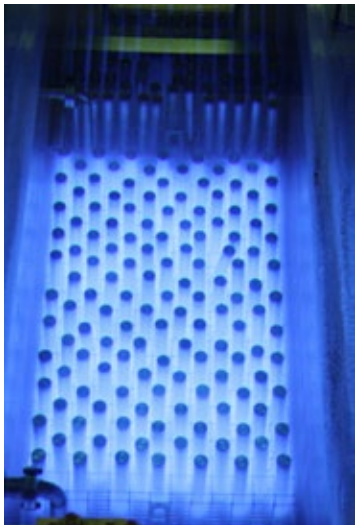
U.S. Department of Energy prime contractor CH2M HILL Plateau Remediation Company (CH2M) awarded a subcontract to design and fabricate a cask storage system for the nearly 2,000 highly radioactive cesium and strontium capsules on the Hanford Site. NAC International received the $23 million subcontract that calls for conceptual, preliminary and final design work for the 16 storage casks, with the first cask fabrication beginning in fiscal year 2019.

The capsules, which are stored at Waste Encapsulation and Storage Facility (WESF), represent a significant portion of the radioactivity present on site. The capsules rest in water-filled pool cells that help keep them cool and provide shielding from radiation. The aging WESF has high operating costs and represents one of the DOE complex's largest risks in a beyond-expected-magnitude earthquake or other similar type of accident.

"The crew at WESF is doing a great job maintaining a facility that's becoming increasingly difficult and costly to operate," said Connie Simiele, vice president of CH2M's Waste and Fuels Management Project. "Removing the capsules from WESF and placing them into a dry storage system will reduce the risk and costs for the storage of the capsules."

The storage casks support DOE's plan to reduce risk and cost by transferring the capsules to dry storage until a disposal pathway is available. In the dry storage system the capsules will be cooled by air and shielded by concrete and steel.

The management of the Cesium and Strontium Capsules Project subcontract award is part of CH2M's continued commitment to meet or exceed subcontracting goals at Hanford. Since the beginning of its contract in 2008, CH2M has awarded more than $2.4 billion in subcontracts. ✱



A pool cell at the Waste Encapsulation and Storage Facility contains water that helps cool and provide shielding for the 1,936 highly radioactive cesium and strontium capsules. The water around the cesium and strontium capsules in the facility pools glows a color of blue in an effect known as the Cherenkov Glow, as the radioactive cesium and strontium decay and lose their radioactivity to become stable atoms.

A WRPS donation helped pay for a computerized system that simulates a variety of radioactive conditions for Columbia Basin College students.

COLUMBIA BASIN COLLEGE
TRAINING FUTURE HANFORD WORKERS

Columbia Basin College (CBC) is helping to meet Washington River Protection Solutions' (WRPS) continuing need for qualified workers through a local education program WRPS has supported since 2009.

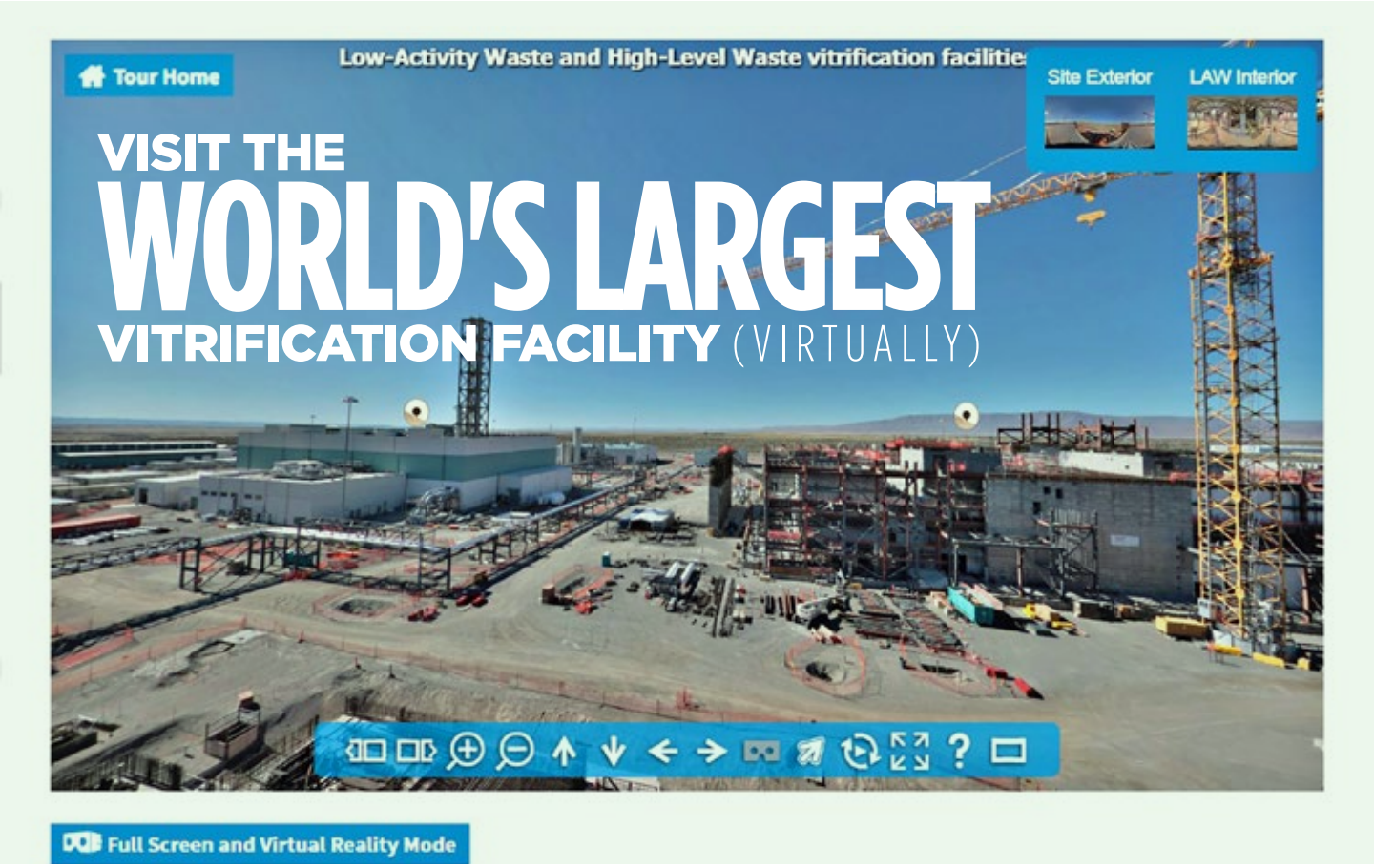
WRPS now employs more than a dozen graduates from CBC's Nuclear Technology Program. The graduates work as non-licensed operators, radiation protection technicians or instrument and control technicians. The program was established by CBC, Hanford contractors and Energy Northwest. WRPS has contributed more than $300,000 to the program for curriculum development, instruction and equipment since 2009.

"WRPS has been a primary supporter and donor for the program. We have six employees who served as adjunct faculty and have maintained a position on the program advisory committee since the program's inception," said WRPS Human Performance Improvement Program Manager Lloyd Keith, who sits on the advisory committee and is currently an adjunct faculty member. "We have had direct input into the curriculum to support our long-term need for qualified employees."

> **"WE HAVE HAD DIRECT INPUT INTO THE CURRICULUM TO SUPPORT OUR LONG-TERM NEED FOR QUALIFIED EMPLOYEES."**
>
> *– Lloyd Keith, WRPS Human Performance Improvement Program Manager*

WRPS donated $32,000 for CBC students to get state-of-the-art training in radiation protection. The donation, along with $80,000 in CBC funds, paid for the purchase and installation of a computerized system that simulates a variety of radioactive conditions within a training space. Students can practice properly using procedures and monitoring equipment, while avoiding radiation exposure. WRPS also helps CBC students with scholarships, currently providing scholarships totaling nearly $60,000.

Because the Nuclear Technology Program meets both U.S. Department of Energy and Institute for Nuclear Power Operations standards, graduates can work in many facets of the nuclear industry. Potential career areas include nuclear power-plant operating and processing facilities and nuclear waste disposal. Instrument and control technicians and non-licensed operators also have transferable skills that give them the option of working in other industries, such as energy generation, process operations, and manufacturing. ✱



The public can now see inside the world's most advanced nuclear waste treatment facilities built to solidify radioactive waste in glass by taking a virtual tour of the Waste Treatment and Immobilization Plant, also known as the Vit Plant. The Vit Plant Virtual Tour is a 360-degree online interactive tour that offers the public a chance to better understand the considerable undertaking of Bechtel and URS employees in building this one-of-a-kind complex.

Virtually visit the active construction site, the nuclear processing facilities and their support structures and go inside the Low-Activity Waste (LAW) Vitrification facility at hanfordvitplant.com/virtual-tour. Peek inside the Vit Plant even as construction continues.

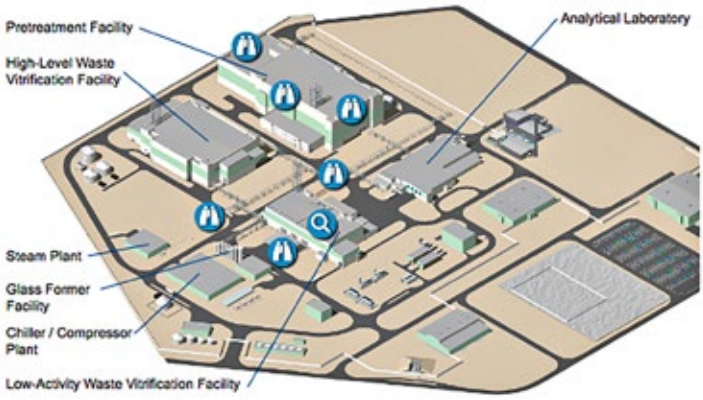
The tour begins with views of the Hanford Site and the Vit Plant facilities. It showcases the inside of the LAW facility, including the two largest waste melters in the world, its process cells and the components of its exhaust treatment system.

The tour also highlights the many support structures being built on the 65-acre construction site. Each tour stop includes information on the facilities, their components and their role in the vitrification process.

Vitrification is the process of mixing liquid radioactive waste with glass-forming materials and heating them in a high-temperature melter. This "liquid glass" is poured into stainless steel containers to cool before being disposed of permanently and safely.

Two 300-ton melters will be used in the LAW Facility to vitrify up to 80 percent of the 56 million gallons of hazardous waste currently stored in underground tanks at the Hanford Site.

The Vit Plant will start processing low-activity waste as soon as 2022, followed by full plant operation, including high-level waste processing, in 2036. ✱



The Hanford Advisory Board

THE HANFORD ADVISORY BOARD'S ADVICE CONTRIBUTES TO HANFORD CLEANUP

From starting demolition of the Plutonium Finishing Plant to removing contaminants from record amounts of groundwater to retrieving waste from single-shell tanks, 2016 marked significant cleanup progress at Hanford.

This progress was followed closely by the Hanford Advisory Board (HAB). Throughout the year, HAB members defined significant issues meriting public input and formulated policy-level advice for consideration by the U.S. Department of Energy (DOE), U.S. Environmental Protection Agency, and Washington State Department of Ecology, the Tri-Party Agreement agencies.

The HAB's advice covered topics ranging from transportation infrastructure and Central Plateau milestone changes to cleanup budgets. Members wrote white papers on managing cesium left over from tank waste treatment and a communications approach for the Waste Treatment Plant.

"The HAB's work has made a significant, positive impact on Hanford cleanup," said Doug Shoop, DOE Richland Operations Office manager. "Members of the board should be proud that the HAB is a respected champion for extensive cleanup progress at the site. The Tri-Party Agreement agencies carefully review and consider every piece of advice or work product coming from the HAB because we know it reflects a wide range of public, tribal and stakeholder input."

Established in 1994 under the *Federal Advisory Committee Act,* the HAB provides a forum for members with diverse local and regional interests to tackle the difficult issues associated with cleaning up the legacy of radioactive and mixed wastes left from more than four decades of plutonium production. The 32 seats on the board represent economic, environmental, and tribal interests, the general public, local and state governments, as well as the health and safety communities. ✱

The board's role is to advise the Tri-Party Agreement agencies — U.S. Department of Energy, U.S. Environmental Protection Agency, and Washington State Department of Ecology — on selected major policy issues related to Hanford cleanup. Through its open public meetings and recommendations on agency public involvement activities, the board is chartered to assist the general public become more informed about and involved in Hanford cleanup decisions.

HOLIDAY GIVING

Hanford Contractors in the Community

VIT PLANT EMPLOYEES donated thousands of toys and more than **$29,000** to the campaign. Peggy McCullough, Bechtel's Project Director at the Vit Plant, joined in the festivities by dressing as Mrs. Claus.

▲ CH2M employees and their families gave back to the community by ringing bells for the Salvation Army. The one-day event raised **$3,500** and included 108 volunteers, 170 hours and 9 locations.

Nearly 20 **MISSION SUPPORT ALLIANCE** employees helped build bicycles with MSA Cares for the Bikes for Tikes program.

Happy Holidays

Employees in **272-AW** celebrated the holiday season by "adopting" a family of five referred by Domestic Violence Services, which provides emergency aid and support to local victims of domestic violence and their children. ▼

MARINES and **BECHTEL EMPLOYEES** work together to load toys from the Vit Plant's 2016 U.S. Marine Corps Reserve's Toys for Tots campaign into a trailer to prepare them for delivery to needy families in the community.